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The Effects of Personal Health Assessments on Health Knowledge and Health Behavior Among Students Enrolled in an Undergraduate Personal Health Course

Jennifer Peeso

Western Kentucky University

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The Effects of Personal Health Assessments on Health Knowledge and Health
Behavior Among Students Enrolled in an Undergraduate Personal Health
Course

A Thesis

Presented to

the Faculty of the Department of Public Health

Western Kentucky University

Bowling Green, Kentucky

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

Jennifer R. Peeso

August 1996

An Evaluation of Personal Health Assessments on Health Knowledge and
Health Behaviors Among Students Enrolled in an Undergraduate Personal
Health Course

Date Recommended 6/21/1996

Thomas Reardon
Director of Thesis

John Blum

R. D. D. W. W. W.

Edmund Brown 7/30/96
Dean of Graduate Studies Date

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Jennifer R. Peeso

August 1996

58 Pages

Directed by: Dr. Thomas Nicholson, Dr. Wayne Higgins, Dr. Richard Wilson

Department of Public Health Western Kentucky University

The purpose of this research was to determine whether personal health assessments would increase Personal Health 100 students' health knowledge and healthy behaviors. This research is important because of the objectives set by Healthy People 2000 to promote health and because of the need for comprehensive school health education programs. By focusing on health promotion in the school setting, more effective preventive programs can be devised.

The factors investigated included health knowledge and the following health behaviors: exercise, alcohol consumption, use of tobacco, sleep, breakfast, sexual activity, and seatbelt use. These factors were chosen based on a longevity theory. Data were collected for this study in the spring semester 1996 at Western Kentucky University. The responses from 244 undergraduate students were collected using the HKI (Health Knowledge Inventory) and a behavioral assessment. The data were analyzed using an analysis of covariance and a chi-square analysis. None of the factors were found to be significantly affected by the personal health assessments. The results revealed that the methods to increase health knowledge and healthy behaviors had no short-term effects on the undergraduate students.

Chapter 1

Introduction

An ounce of prevention is worth a pound of cure. Not only is the cliché old as the hills but it is also one of the most important undertones of our changing health care system. Over the past 30 years, health care costs have risen in the United States from 4% to 14 % of the Gross National Product, (Fries, 1993). These health care costs may be significantly lowered by developing programs that emphasize health promotion and preventive care. Prevention is extremely important since approximately 70% of illness and the associated costs in the United States are preventable. (Fries, 1993, p. 321)

In September of 1990, the US Public Health Service (PHS) issued a national initiative to improve the health of all Americans through a coordinated and comprehensive emphasis on prevention. Healthy People 2000: National Health Promotion and Disease Prevention Objectives (United States Department of Health and Human Services [USDHHS], 1992) is the product of a cooperative effort among government, voluntary and professional organizations, business and industry and individuals to improve the nation's health through individual, collective, and environmental change. Healthy People 2000 (USDHHS, 1992) set three broad goals for the year 2000: 1) increase the span of healthy life for Americans, 2) reduce health disparities among Americans and 3) achieve access to preventive services for all Americans. To help meet these goals, 300 specific objectives were set in 22 priority areas. One of the first issues addressed in Healthy People 2000 is to promote health "...through the reduction of high-risk behaviors and improvement of healthy behaviors related to physical activity, nutrition, smoking, alcohol and other drugs, family planning, mental health, and violence." Since the implementation of the Healthy People 2000 objectives, there

has been noted success in achieving some of the objectives; however, there still exists the need for continued implementation and advancement in preventive services.

Purpose of the study

The purpose of this study was to determine behavioral change and knowledge gain in Personal Health 100 students when the classroom curricula is accompanied with a personal health assessment.

Need for the study

One of the focuses of Healthy People 2000 has been on worksite based wellness programs. To their merit, these programs have successfully reduced risk-related employee medical costs, days of absenteeism, and helped to improve employee blood pressure and cholesterol levels.

Another area of focus for wellness programming is in school health education. However, few efforts have been made to implement innovative educational strategies. Yet, "School health education can be a key instrument in the fruition of the Healthy People 2000 National Health Promotion and Disease Prevention Objectives. School health education cannot be overemphasized considering the 48 million students who represent about 20% of the U.S. population." (O'Rourke, 1995, p. 33) Healthy People 2000 includes several objectives to implement school health education programs in primary, secondary and post-secondary school systems.

The addition of health issues to school curricula may help meet the goals set in Healthy People 2000, but it also introduces new questions--such as, what is the best method of presenting the information? The concept of comprehensive school health education was developed as an effective and efficient guide for

school health educators and administrators. Evidence of comprehensive school health education's effectiveness needs to be further explored.

Significance of Study

By focusing on health promotion in the school systems, more effective preventive programs can be devised. As more students are targeted in health promotion, the chances of developing better health habits among the population increase. The increase in better health habits may lead to healthier life spans, higher quality of life, and reduced medical costs, thereby affecting not only the healthier individual but society as a whole.

Hypotheses

1. Personal Health 100 students participating in the personal health assessments will have increased health knowledge as compared to the students who did not participate in the personal health assessment.
2. The students participating in the personal health assessment will demonstrate an increase in healthy behavior as compared to those that did not.

Delimitations

1. This study is delimited to Personal Health 100 students under the instruction of Dr. Carter, Dr. Schuster, and R. Carter at Western Kentucky University during the 1996 spring semester.
2. Only the students present on days of the health knowledge inventory and behavioral assessment administration were included in the study.

Limitations

1. The generalizability of the results may be limited because the responses of these students may not be representative of students of other geographic locations.
2. The study did not account for other factors involved in the learning process of the students.

Assumptions

1. The students will be honest when answering the surveys.
2. Health knowledge gains came primarily from Personal Health 100 lectures and personal health assessments.
3. All Personal Health 100 instructors present the same material in equivalent amounts.

Chapter 2

Review of Related Literature

The purpose of this study was to determine knowledge gains and changes of health behavior in Personal Health 100 students participating in a personal health assessment. The need for the study is determined by the demand for new multifaceted school health promotion programming.

In order to build a foundation for the study, the literary review begins with articles related to preventive health care and services, followed by some goals and objectives listed in Healthy People 2000. Then articles relating to worksite health promotion programs and their implementations will be discussed as the precursor to school health programs and their implementation. Finally, several studies similar in concept and methodology to this project will be discussed.

Preventive Care.

During the past century, Americans have experienced and benefited from many improvements in standard of living through medicine, technology, and public health. For example, over the past century the average life span has increased from 47 to 75 years. However, the notion that the United States health care system is faltering goes undisputed. The rise in health care costs and lack of improvement in some aspects of public health attests to the faltering system. According to Mason, Assistant Secretary of Health 1992,

...for all our technology and all our spending, we do not have the health outcomes we might expect. U.S. life expectancy at birth ranks 18th among 39 industrialized countries for females, 22nd for males. For comparison, life expectancy for an American male born in 1988 was 71.5 years; a

Japanese male born at the same time had a life expectancy of 75.8 years....The per capita health care expenditure for the U.S. in 1989 was 40 percent higher than Canada and 127 percent higher than Japan (1993, p.234)

Even with the advanced technology and biomedical capabilities, America's health problems are far from being solved. Without diminishing the importance of science and technology, the precise role of biomedical advancement in America's health must be further clarified.

Americans have developed an unspoken dependency or faith in the medical profession. However, an interesting event took place on New Year's Day in 1976. In response to the rising cost of malpractice insurance, doctors in Los Angeles County staged a work slowdown, refusing for five weeks to perform any nonemergency surgical procedure. With this slowdown came a reduction in the surgery rate of 60%, which cost medical centers \$25 million and triggered 30,000 layoffs. To hospital administrators, the slowdown was almost considered a "full disaster"; but from the public health perspective, the slowdown was hardly a catastrophe. During that five week period, the community experienced "the lowest rate of mortality they had seen in five years." Researchers later concluded "that greater restraint in elective surgical operations might well improve U.S. life expectancy" (Cowley, 1993, p. 63).

The slowdown sparked a rethinking of the role of medical treatments in health care. The issue posed to policymakers began to turn from funding more treatments for more people to gauging the impact of different kinds of care and determining the method most effective in each case. The slowdown demonstrated that the U.S. can indeed have a healthier society without a high demand on technology. With this acknowledgment came an increased interest in preventive care and services.

With the increased attention on preventive care, the present generation has witnessed what early health care reformers could only allege. The positive impacts of prevention have been documented in a wide range of health care aspects. During the past two decades, the American population has "witnessed dramatic declines in death rates for heart disease (51% reduction) and stroke (60% reduction)" (Satcher, 1995, p. 1150). Immunizations have also shown marked benefits in that they can save \$14 in treatment for every \$1 spent on immunization, (Satcher, 1995). Increased awareness in preventive care has shown to be an effective method in reducing the costs of health care and promoting healthful lives.

However preventive care, like high-tech medical procedures, also has a distinct role in the health care system. In the article, "Is Preventive Medical Care Worth the Cost?" (Merline, 1995), the issue of preventive medical care is evaluated. It is stated that no issue in medicine appears to have been so definitively answered as the need for preventive medicine. The need is substantiated by the fact that nearly 70 percent of illness and the associated costs in the United States are preventable. Merline (1995) further explains that preventive medicine can be divided into two distinct categories: prevention and preventive medical care. Prevention is defined as anything that can prevent a disease such as eating a proper diet, getting adequate exercise and sleep, avoiding being overweight, not smoking, drinking in moderation, proper sanitation, and immunization. Merline stated that "the medical literature has conclusively demonstrated that many diseases and premature deaths are avoidable simply by choosing healthy eating and living habits." (1995, p. 18)

Preventive medical care has a much more narrow definition including regular exams and screening tests designed to catch a disease or a health problem

before it has a chance to produce any symptoms. However, studies indicate that these methods actually add to the cost of health care. For example, testing for and treating high blood pressure and high cholesterol costs more money than it saves by preventing stroke or heart disease as high blood pressure and high cholesterol are becoming more rare and testing everyone costs "plenty of money." Also, medical testing has become inundated with false positives and negatives. Merline (1995) noted several studies, within the unprecedented Health Insurance Experiment conducted by the Rand Corporation, found that preventive care had little effect on the health status of individuals. Thus, just as technology has its place in health care, so does prevention and preventive medical care.

Healthy People 2000 National Health Promotion and Disease Prevention Objectives.

In response to the scrutiny of health care services and American health status, the need for specific health goals has evolved. Healthy People 2000 (USDHHS, 1992) was a cooperative effort among organizations and individuals to improve the nation's health through individual, collective, and environmental change. It has set a course of improved health through many preventive measures addressing everything from cancer prevention to occupational safety. Within its scope, numerous objectives focus on preventive health care.

As stated by Healthy People 2000 (USDHHS 1992), preventive services include counseling, screening, and immunization. Priority areas for these interventions include maternal and infant health, heart disease, stroke, cancer, diabetes and chronic disabling conditions, HIV infection, sexually transmitted diseases, and infectious diseases. Healthy People 2000 (USDHHS, 1992) provides an outline of intervention goals and strategies in which the goals may be attained.

Worksite Health Promotion.

Healthy People 2000 (USDHHS, 1992) has provided specific examples of strategies that are currently in use at American worksites. Based on the Healthy People 2000 Objectives, the goal of health professionals is to "increase to at least 85% the proportion of workplaces with 50 or more employees that offer health promotion activities for their employees as part of a comprehensive health promotion program." The worksite is an ideal location to implement health promotion programs for several reasons. First, worksites harbor a large proportion of the American population; therefore, worksites provide a substantial number of people for health promoters to target. Secondly, if the worksite is large enough, it can provide proper facilities to carry out health programs, such as meeting rooms or even a staff nurse. And third, worksites can sometimes provide the funds necessary for the program. Employers favor health promotion on the worksite in hopes of increasing productivity and decreasing health care costs. By encouraging workers to adopt healthful lifestyles, emphasizing close monitoring of chronic diseases, and changing workplace behavior, employers are cutting health related expenses. The benefits of worksite health promotion and education programs have been widely recognized and acknowledged.

Recent studies have proven worksite health programs a successful location to implement health interventions. Coors, for example, has shown a \$6.15 return on investment per \$1 invested into health promotion programs at the worksite; Bank of America has shown a \$6.00 return for every \$1 invested. In a study correlating positive changes and worksite health education, Rebecca and Kim Anderson noted a well-known worksite health education program, "Live for Life", implemented by Johnson and Johnson Inc. The program included a health profile of behavioral, attitudinal, and biometric measures (Anderson, 1994). Johnson and

Johnson calculated that the Live for Life wellness program has saved \$378 per employee per year (Leavenworth, 1995).

Health Promotion and School Education.

If prevention is to be one answer to future of United States health care problems, then the primary focus needs to be on the nation's future decision-makers, America's youth. There is one clear reason why the young should be the target of health education--that is, within the younger population, we have the opportunity to create good health habits before poor habits have the chance to develop. "As health scientists probed for antecedents of various behaviors, they found that lack of knowledge represented only one of many factors that influence a decision" (Allensworth, 1994, p.180). A review of health behavior literature reveals six critical factors in influencing health behavior: (a) knowledge about the disease; (b) perceived threat of illness; (c) attitudes about health care; (d) social interaction; (e) social norms; (f) and social structure, accessibility of health services and demographic factors. It has therefore been determined important to use multiple interventions when trying to effect behavioral, environmental, or social changes (Allensworth, 1994). Allensworth (1994) indicates the importance of not only health education but also the need to develop multifaceted promotional programs.

A statement by Ernest L. Boyer may well bring to light the importance of health education.

Clearly, no knowledge is more crucial than knowledge about health.

Without it, no other life goal can be successfully achieved. Therefore, we recommend that all students study health, learning about the human body, how it changes over the life cycle, what nourishes it and diminishes it, and how a healthy body contributes to emotional well being Boyer, 1983 (Allensworth, 1994, p. 180).

Allensworth (1993) included a description of health education as defined by the National Professional School Health Education Organizations, it includes:

- 1) a planned, sequential, prekindergarten to grade 12 curriculum based on students' needs and current health concepts and societal issues,
- 2) instruction intended to motivate health maintenance and promote wellness and not merely to prevent disease,
- 3) activities to develop decision-making skills and individual responsibility for one's health,
- 4) opportunities for students to develop and demonstrate health-related knowledge, attitudes, and practices,
- 5) integration of the physical, mental, emotional, and social dimensions of health as the basis for study of the 10 content areas: community health, consumer health, environmental health, family life, growth and development, nutritional health, personal health, prevention and control of disease, safety and accident prevention, and substance use and abuse, and
- 6) the use of program planning, including formative and summary evaluation procedures, an effective management system and resources.

Some evidence supports the effectiveness of this approach. A survey of 4,738 third through 12th grade students in 199 public school revealed that as years of health instruction increased, students' health-related knowledge, positive attitudes, and healthy habits increased. For example, 43% of students with one year of health instruction drank alcohol "sometimes or more often," compared with 33% of students with three years of health instruction. In addition, 13% with one year of health instruction had taken drugs compared with 6% for those with three years of health instruction. Only 72% of those with one year of health instruction exercised outside of school compared with 80% of those with three years of health instruction (Allensworth, 1994).

School-based health education is indeed transforming. Allensworth (1994) attributes the evolution to several factors:

- 1) traditional health education has not fulfilled its mission of facilitating adoption of health-enhancing behaviors,
- 2) children and youth face a number of serious health problems,
- 3) behavioral scientists from various disciplines are reaching a consensus about what works to prevent high-risk behaviors, and
- 4) policymakers, administrators, and other educators are asking for a new kind of health education.

This "new kind of health education" has taken on a comprehensive and multifaceted approach. It identifies several practices that contribute to making health education sophisticated and multifaceted, extending beyond traditional information dissemination.

In the past, educators thought providing students with information would result in behavior change; improved knowledge would alter attitudes, which in turn would alter behavior. As health scientists probed for the antecedents of various behaviors as previously mentioned, they found that lack of knowledge was only one, and often not the most important, of many factors that influence decisions. Allensworth (1994) explained that different models have been developed to explain behavior; however, none has been developed to explain all behaviors. A meta-evaluation of educational research has revealed that cognitive, affective, and psychomotor learning are influenced by three major factors: aptitude, instruction, and environment. Professionals from both fields of health and education have identified a variety of factors that influence learning and behavior. They agree that it is time to implement a health promotion model in the educational system that uses a variety of strategies in addition to instruction in order to foster the adoption

of health-enhancing behaviors. The health promotion model has potential at all levels of education, from primary to postsecondary (Allensworth, 1993).

A publication from the U.S. Department of Health and Human Services, "School Health: Findings from Evaluated Programs," listed several approaches for improved schools health programs for students in public and private elementary and secondary schools as well as institutions of higher education (O'Rourke, 1995, p. 35). The improved approaches were developed from existing school health programs throughout the nation including information from health and education officials as well as school and community leaders who were interested in initiating and improving school health programs. Several approaches included traditional classroom instruction, participatory classroom activities, activity-oriented curricula, and social learning strategies. (O'Rourke, 1995, p. 36)

O'Rourke recognized the need for multiple interventions in school health education. O'Rourke suggested that school health education extend beyond the classroom setting, "While much school health research focused on students in the classroom, school health education is much broader than that, and research interest need to reflect this breadth" (O'Rourke, 1995). O'Rourke noted that much of school health education research has been focused on a single intervention and stressed the need for more emphasis on multiple interventions. Some suggestions made for multiple interventions included community and school policy mandates, environmental changes, as well as direct interventions such as screening and follow-up. O'Rourke also encouraged the provision of "health education interventions across multiple disciplines and in various school sites such as the cafeteria, gymnasium, clinic, and classrooms" (O'Rourke, 1995, p. 36).

Dr. Allensworth agreed with the need for a multiple intervention approach for school health education in her article "The Research Base for Innovative

Practices in School Health Education at the Secondary Level" (Allensworth, 1994). Allensworth stated, "While the classroom provides specific structured learning sequences in health instruction, delivering health messages through additional channels is appropriate" (1994, p. 181). Allensworth reasoned that since health status and health risk result from multiple factors, it is necessary to use multiple interventions when trying to effect behavioral, environmental and social changes. Allensworth suggested 10 areas of focus including the following:

- 1) replacing health instruction model with a health promotion model that employs multiple strategies,
- 2) Coordinating health promotion activities throughout the school and community programs including infusion of health content throughout the curriculum,
- 3) promoting the coordination of the school health program within the school through interdisciplinary and interagency teams, and
- 4) recognizing the commonality of skills needed to address various health issues and includes these common skills in the curriculum.

School health education once was based on emphasizing dissemination of knowledge. Now the process is evolving to placing an emphasis on the modification of health behavior. (Allensworth, 1994, p. 187)

Health education and health promotion activities in postsecondary settings have special merit. Postsecondary institutions include two- and four- year community colleges, universities, and trade and technical schools. Colleges and universities are the developmental core for the nation's future leaders, teachers, corporate executives, health professionals and public health personnel. The involvement of the future leaders in health promotion programs during their

postsecondary education will contribute to health being instilled and redistributed among the future patients, students, and employees of today's students. (Healthy People 2000 1992, USDHHS)

Postsecondary schools also offer one of the few settings outside the military where a large number of 18-to 24-year olds can be easily reached. Currently, more than 12 million students, 5% of the U.S. population, are enrolled in U.S. colleges and universities. Two million are full-time students between the ages of 18 and 22 living on campus. As health beliefs and practices are still developing during late adolescence, it is important to continue to model, encourage, and support lifestyles conducive to good health. In addition, if the United States is to be successful in addressing important public health problems, such as HIV transmission and substance abuse, this student population will be a key group to influence.

Healthy People 2000 recognizes that several characteristics of the postsecondary school environment provide unique opportunities for student health promotion and disease prevention. The nature of the school, college, or university as a learning environment offers many points for intervention. In classes and other structured settings, students are a captive audience. Well-established student services can play a central role in health education and health promotion activities for students. Facilities such as sports arenas can be used for health promotion activities. Students themselves tend to be interested in taking a leadership role in developing educational campaigns for their peers. (Healthy People 2000 1992, USDHHS)

Providing health education programs on postsecondary school campuses also takes advantage of the readily accessible staff of experienced professionals present in the various health fields. These professionals can collaborate in establishing effective institution-wide health promotion programs. As stated in

Healthy People 2000, "Not only does the program benefit, but such collaboration benefits faculty by providing them with research and practice opportunities to further enhance or maintain their skills" (p. 257).

Presently there are no reliable national estimates of the proportion of postsecondary schools that offer institution-wide health promotion programs for students, faculty, and staff. Surveys of 3,000 postsecondary institutions conducted by the American College Health Association in 1989-1990 suggest that at least 20% of the institutions surveyed offer health promotion activities for students. Another estimate is available for schools of medicine. In 1986, 143 accredited medical schools in the United States, Canada, and Puerto Rico were surveyed to determine how many offer health promotion programs for their students, faculty, and staff. Of the 120 respondents, 29 schools (24%) reported offering a program for students and 45% of these offered programs for faculty and staff. (Healthy People 2000 1992, USDHHS)

Related Studies

Screenings as a Site for Health Promotion.

Many studies have used health screenings as opportunities to measure health behavior, attitudes, and knowledge. Screenings provide researchers with a population to study in an appropriate setting.

In an attempt to measure health attitudes and behavior in women, Kottke, Trapp, and Fores (1995), designed a study involving random-digit-dial telephone interviews of women in 15 counties of southwest Minnesota. Information requested during the interview included a series of questions about Papanicolaou tests (for women 18 years and older), clinical breast examination (for women 40 years and older), and mammography screenings (for women 40 years and older). Kottke et al. (1995) were trying to determine the reasons why women did not regularly participate in these preventive care measures and to determine whether

the women in the population would both accept and respond to systematic reminders to be tested.

The self-reported test rates varied among the population and between each test. Of the women between the ages of 18 to 29 year's old, 80% reported having had a Papanicolaou test in the past year. That figure declined linearly with age. Self-reported rates of mammography and breast examinations also declined with age.

When the women were questioned about their attitudes toward being prompted to have cancer screenings, the group remained ambivalent. According to Kottke et al. (1995), the responses to the survey indicated that the women would be more likely to participate in cancer screenings if their physician were to recommend it. However, the women explicitly indicated that they would not like their physicians to tell them. Kottke et al. interpreted "the principles of behavior shaping and social learning theory to indicate that these women will come to prefer screening only if the benefit of taking action (rather than the risk of inaction) is the dominant message and they received positive reinforcement for taking action." (1995, p. 1104) The conclusion would indicate that for women to adopt cancer screenings into their lifestyles, more than just providing reminders and opportunities will have to be implemented.

A study conducted by Watson et al. (1992) used cystic fibrosis (CF) screenings to assess education benefits. The impact of screening on carriers, and on a sample of those testing negative, was assessed by self-administered questionnaires. The pretest questionnaire recorded a range of sociodemographic characteristics, assessed previous knowledge of CF and its inheritance, and investigated reproductive attitudes. State anxiety was also assessed. Once the subjects were notified of the results, the carriers participated in counseling

sessions and completed a follow-up questionnaire; the non-carriers completed only the questionnaire.

The results indicated that both the carriers and non-carriers were glad to have completed the screening. Watson noted, "It was encouraging that being screened has increased awareness of CF and recessive inheritance even for those testing negative, and it is very unlikely that carrier testing will stigmatize or cause lasting psychological damage to those testing positive" (Watson, 1992, p. 220). In this case, screening seems to have provided enough material to educate the participants in general about CF.

Worksite based, health promotion studies.

As the workplace has been a primary location to implement health promotion programs, it has also been a key location to conduct health behavior research. Anderson and Anderson (1994) recognized that initiating and sustaining changes in behavior is an issue of growing concern to business and industry. Now health educators and wellness experts are searching for methods to encourage employees' participation in health or wellness programs as well as establishing program content of interest and usefulness. Anderson and Anderson (1994) conducted a study of a major manufacturing corporation in a metropolitan midwestern city. The study was designed to measure whether participation would improve knowledge of health practices and awareness of personal health risks by initiating health-related lifestyle changes in the employees. The Lifestyle Assessment Questionnaire was used to collect medical history and lifestyle evaluations (exercise, nutrition, self-care, vehicle safety, stress awareness, and stress management). At this time, biometric measures and a pretest were also administered. The employees were then introduced to positive lifestyle practices and four 60-minute educational components. At the completion of the educational

components, the health-risk assessment and biometric measures were repeated. Results indicated overall improvement on all variables investigated. Anderson and Anderson (1994) concluded that the brief evaluation indicated that this multifaceted health-education program provided a significant opportunity for participant in exercise, stress management, and improvement in systolic blood pressure readings.

In another study, Weinberg, Iammarino, Laufman, and Trost (1992) investigated the appropriateness of the school health promotion programs and demonstrated how cholesterol screening is an effective tool to introduce into a school system. A total of 1,217 school employees in the Victoria (Texas) Independent School District participated in the program. School employees responded positively to the cholesterol screening, which took place over a two-week period. The program utilized school facilities and school-staffed nurses.

Weinberg et al. (1992) concluded that this type of screening should be a part of a multi-component health promotion program. The demonstration project has shown that cholesterol screening stimulated employee participation because of the background level of interest created by the media and because each individual received qualifiable results. "As teachers and other school personnel learn about the importance of lowering blood cholesterol levels, they then can educate students. In turn, students will take the information home, and ultimately entire families could be made aware of one of the major risk factors for cardiovascular disease" (Weinberg, 1992, p. 49).

As it has been explained, postsecondary institutions can provide an ideal setting to implement health promotion programs. Destefano and Richardson (1992) conducted a study involving college freshmen. The participants completed a health risk appraisal, the Lifestyle Assessment Questionnaire (LAQ), and were given a number of physical tests including measures of body composition,

cholesterol, blood pressure, and pulse rate. All participants were tested in the early part of the fall term. DeStefano and Richardson (1992) investigated the relationship between health knowledge and actual wellness. Results of the study indicated the existence of a moderate relationship between the physical assessments and the self-reported data on the LAQ. Further analyses indicated several significant correlations between the wellness scales and life expectancy scores. However, the researchers concluded that further study is needed.

Chapter 3

Methodology

This chapter provides a description of the methods that were used to complete this study. It includes the research question, a statement of the hypothesis, the null hypothesis, population and sample selection, instrumentation, and the methods to be followed.

Research Question

The research question that will be guiding the study is as follows:

Will incorporating personal health assessments into Personal Health 100 classroom curriculum increase students' health knowledge and healthy behaviors?

Hypotheses

1. Personal Health 100 students participating in the personal health assessments will have increased health knowledge as compared to the students who did not participate in the personal health assessment.
2. The students participating in the personal health assessment will demonstrate an increase in healthy behavior as compared to the student who did not participate in the personal health assessments.

Null Hypothesis

1. The Personal Health 100 students participating in personal health assessments will demonstrate the same amount of health knowledge gained as students not participating in the personal health assessments.
2. All Personal Health 100 students, with and without the personal health assessments, will demonstrate the same amount of healthy behavior changes, if any.

Population and Sample Selection

The population from which the study subjects were drawn was Western Kentucky University students enrolled in Personal Health 100 classes during the spring of 1996. During this time, the University was piloting a procedure in which the department mandated four Personal Health 100 classes to participate in personal health assessments as pilot study.

The population consisted of all Western Kentucky University students enrolled in Personal Health 100 classes during the Spring 1996 semester. All students in attendance on both days of the administration of pretest and posttest were included in the sample. Three classes chosen for the pilot study were instructed by R. Carter the other by Dr. Schuster. The two control classes were instructed by Dr. Carter, R. Carter's husband. Dr. Carter's classes were selected as the control group based on the assumption that both instructors would present the classroom material in a homogenous fashion making the two groups more similar. A fourth treatment group, instructed by Dr. Schuster, was added to the sample as they were also participating in the assessments. The average class size was 40 students with a total of 238 students participating in the study.

Research Design

As the focus of this study was to determine whether personal health assessments increased knowledge gains and improved health behaviors when incorporated into the classroom curricula of Personal Health 100 students, the study followed a quasi-experiment design. The Health Knowledge Inventory (HKI) (Appendix A) and a behavioral risk assessment (Appendix B) were administered twice during the semester, once at the beginning and again near the conclusion of the semester. The Health Knowledge Inventory was designed to measure knowledge gained through college personal health courses and measuring

knowledge gained through other health education interventions. These data were collected and entered into SPSS.

Instrumentation

The instrument selected to measure health knowledge was the Health Knowledge Inventory (HKI). The HKI was designed to measure general health knowledge gained through college personal health courses and to measure overall health knowledge (Nicholson, Price, and Higgins, 1990).

Construction, Validity, and Reliability of the Health Knowledge Inventory

The HKI was developed in 1988, as a general knowledge test for college students. All phases of the health inventory development were reviewed by an expert panel. A consensus was reached to include the following relevant health content areas: accidents and safety, aging and death, chronic disease, communicable disease, consumer health, environmental health, human sexuality, mental health, nutrition, physical fitness, and substance use/abuse. The questions included in the inventory were selected with the assistance of a distinguished national panel of Health Education jurists. The inventory was administered to Western Kentucky University students enrolled in personal health courses for item analysis and initial test-retest reliability estimation. The students completed the inventory at the beginning of the semester, then again one week later. Final item selections met item analysis value requisites and were included in the 110 item version used in this study. The inventory was administered to over 2,000 additional students from 17 different schools to complete the analysis.

Validity.

The validity was assessed for the HKI in a variety of ways. The three major types of validity considered in the evaluation were content validity, criterion-related validity, and construct validity.

An estimate of predictive validity was obtained by correlating start of the semester scores on the HKI with final grades in students personal health courses. A significant positive correlation was found between HKI scores and personal health final grades ($r = +.35$; $p < .0001$; $n = 1,024$) which established a reasonable, yet modest, level of criterion-related validity for the HKI.

Construct validity was demonstrated by successfully predicting that various groups would score differently on the HKI based on their varying levels of personal health knowledge. The following groups were compared: 1) family practice medical residents ($n = 8$, $\bar{x} = 98.75$, $SD = 3.66$), 2) senior level undergraduate and masters level public health/health care administration students ($n = 66$, $\bar{x} = 86.42$, $SD = 11.16$), 3) community health agency professionals ($n = 52$, $\bar{x} = 81.31$, $SD = 20.71$), and 4) students enrolled in personal health classes ($n = 30$, $\bar{x} = 61.00$, $SD = 13.12$). General linear models ANOVA revealed a significant difference among these four groups ($F = 23.72$; $3, 152$; $p < .0001$). All groups were significantly different from each other, except the health majors and health professionals who did not differ from each other. The physicians scored higher than the health majors ($p < .0315$), health professionals ($p < .0029$), and personal health students ($p < .0001$). As expected, the physicians' mean score (98.75) was higher than all of the other groups. The health majors/professionals scored lower than the physicians but still 20-25 points higher than the personal health students. These differences were what would be expected if the HKI measured personal health knowledge. Thus, the developers concluded that these data demonstrated construct validity for the HKI. (Nicholson et al., 1990)

Reliability

Test-retest reliability estimates ranged from .81 to .97 among the six schools tested. The overall test-retest reliability estimate for all schools combined

was .89 ($n = 505$). These data supported the premise that the HKI possesses a high level of test-retest reliability--that is, among the population studied, observed scores were consistent over time.

Internal consistency of the HKI was measured using the KR20. The overall KR20 estimate (i.e., first administration only) was .91 ($n = 2,329$). Among the 17 schools tested, KR20 values ranged from .86 to .95. These data provide support that the HKI is internally consistent. Also, for the schools tested, the level of internal consistency was similar across different groups. For those schools that took the HKI twice, in eight out of the nine schools, the second administration KR20 value was the highest of the two internal consistency estimates. These results may indicate that students learned from taking the HKI the first time, reducing the amount of error due to guessing in the second testing (Basch and Gold, 1985). However, the difference between these values is very small. The overall KR20 value at the second administration is .92 compared with .91 for the first administration. (Nicholson et al., 1990)

The behavioral assessment administered in this study is a modified version of a survey based on Belloc and Breslow's factors determining longevity. Belloc and Breslow (1972, 1973) established a relationship between physical health and actual day-to-day activities; otherwise known as lifestyle behaviors. The studies examined the relation between common health practices, including hours of sleep, regularity of meals, physical activity, smoking and drinking, and physical health status. Good practices were shown to be associated with positive health. The relationship of these activities was found to be cumulative, "those who followed all of the good practices being in better health...than those who failed to do so." (Belloc, 1973, p.68). This association was found to be independent of age, sex, and economic status.

A follow up study by Belloc confirmed the previous findings. Belloc's (1973) study compared the day-to-day activities to mortality over a five and a half year period. Belloc found that the "individual health practices, smoking, weight in relation to desirable standards for height, drinking, hours of sleep, regularity of meals and physical activity, were related to mortality in the expected direction." (Belloc, 1973, p. 67) Essentially, these studies established the connection between better health status and specific lifestyle behaviors.

The behavior assessment used for this study incorporated the theories of Belloc and Breslow for the most part. Issues derived from the Belloc and Breslow studies include hours of sleep, physical activity, regularity of meals, and smoking and drinking habits. Two more issues were addressed in the behavior assessment, sexual behavior and seat belt use. An expert panel determined the modified survey to have a high face validity.

Procedures

This study followed a pretest, posttest nonequivalent control group design. The surveys were administered once at the first of the Spring 1996 semester, then again near the conclusion of the semester. All six Personal Health 100 classes received the tests. The students used only the last four digits of their social security number as identification. This measure was used to insure the confidentiality of the students as well as allow for pretest and posttest score comparisons. The tests were given during class time to illicit a high response rate.

Near the beginning of the semester, R. Carter's and Dr. Schuster's classes participated in the personal health assessments. The assessments were performed by the professional staff in the exercise physiology laboratory at Western Kentucky University. The assessment evaluated current level of fitness in seven areas and compared each with national norms. The assessment included the following:

- resting blood pressure
- muscular strength
- body composition (skinfold)
- submaximal exercise test
- flexibility
- individual exercise prescription

Data Analysis

Data collected by the HKI and the behavioral assessments administered in 1996 were the only data analyzed. In addition, only the data from students completing both the pretest and posttest were used. These data were collected from 244 students. Data were analyzed using an analysis of covariance on SPSS. The HKI contained 110 items and the mean number of correct responses were analyzed. The behavior assessment contained a total of 11 items for analysis. The responses collected by the behavior assessment were coded for the analysis.

The data were analyzed using the statistical tool analysis of covariance (ANCOVA). ANCOVA takes into account the "relationships among the concomitant, predictor, and criterion variables." (Kachigan, 331, p. 372) This consideration was important as the subject groups could not be randomly assigned to control or treatment groups; therefore, ANCOVA was utilized to minimize biasing influences on the measured variables prior to treatment and to increase statistical power.

Chapter 4

Results

The purpose of this study was to determine whether incorporating health assessments into Personal Health 100 curricula would increase health knowledge and healthy behavior. Data were collected with the Health Knowledge Inventory and a behavior assessment survey during the Spring semester, 1996, at Western Kentucky University. The sample studied was students taking Personal Health 100 from Dr. Carter, Dr. Schuster, and instructor Carter. The data were entered into an SPSS data file to determine the relationships between the variables. The dependent variables were health knowledge and health behaviors including (a) exercise habits, (b) tobacco use, (c) alcohol consumption, (d) breakfast, (e) average hours of sleep per day, (f) sexual activity, (g) safe sex, and (h) seatbelt use.

Description of Study Sample

A total of 244 students completed the HKI and behavioral assessment. However, only 238 (97.5%) students participated in both the pretest and posttest, 80 in the control group and 158 in the treatment group. The data entered into analysis were matched pairs, those having completed both pretest and posttest. The mean age of the treatment group was 21.4 years (Standard Deviation = 4.0, Range = 19 years to 39 years). The mean age of the control group was 21.2 years (Standard Deviation = 4.0, Range = 19 years to 35 years). An analysis of variance was calculated comparing both groups on age; and, there was found to be no significant difference between groups ($F = .2646$; d.f. = 1, 193). The gender

distribution favored females in both the control and treatment groups. Of the 72 reported data for the control group, 58 (80.6%) were female and 14 (19.4%) were male ($n = 8$ missing data). In the treatment group 84 (63.6%) of the 132 treatment participants were female and 48 (36.4%) were male ($n = 26$ missing data). A chi-square analysis was performed to determine if differences existed between the proportion of females and males in the treatment and control groups. The results of the analysis indicated a higher proportion of females was associated with the control group, $\chi^2(1, n = 204) = .012, p < .05$.

Descriptive Data

Data on the subjects' HKI scores and responses to the behavioral assessment are summarized in Tables 1-4. The tables display the pretest and posttest mean scores for both groups and the standard deviations. The information in Tables 1 and 2 indicate that there was no difference between the treatment and control group on any of the dependent variables at the start of the course.

Hypothesis Testing

Research Hypothesis 1: Personal Health 100 students participating in the personal health assessments will have increased health knowledge as compared to the students who did not participate in the personal health assessment.

To test this hypothesis, analysis of covariance was performed, using the HKI raw scores from the posttests as the dependent variable, the pretest scores as the covariate, and the treatment as the independent variable. As can be seen in Table 5, the analysis found no significance between the treatment group and the control group. The pretest and posttest HKI means are graphed in Figure 1.

A repeated measures analysis of variance was performed within each study group to compare pretest to posttest scores. In the treatment groups the posttest mean ($\bar{x} = 72.8$; S.D. = 14.9) was not significantly different than the pretest mean ($\bar{x} = 66.3$; S.D. = 14.0) ($F = 1.04$; 1, 174 d.f.; ns). The posttest mean of the

Table 1

Summary of Pretest Data

Variable	Treatment (n=152)		Control (n=80)		F	p*
	\bar{x}	S.D.	\bar{x}	S.D.		
HKI	66.30	4.00	63.50	11.60	2.2510	ns
Exercise/week	2.05	1.73	1.87	1.88	.3400	ns
Cigarettes/day	1.69	5.39	1.69	4.48	.0001	ns
Alcohol/week (drinks)	2.67	4.74	2.38	4.15	.1810	ns
Breakfast/week (days)	3.53	2.47	3.61	2.48	.0511	ns

*ANOVA

**ns = no significance found at alpha = .05

Table 2

Summary of Pretest Data

Variable	Treatment (n=152)		Control (n=80)		²	p
	<u>Yes(%)</u>	<u>No(%)</u>	<u>Yes(%)</u>	<u>No(%)</u>		
Use Tobacco						
	30(20.5)	116(79.5)	18(23.4)	59(76.6)	.62507	ns*
Use Alcohol						
	83(43.2)	63(56.8)	38(49.4)	39(50.6)	.28519	ns
Five drinks or more in past two weeks						
	27(18.6)	118(80.5)	15(18.6)	62(81.4)	.87628	ns
Snack between meals						
	95(66.0)	49(34.0)	60(77.9)	17(22.1)	.06439	ns
Sexually active						
	92(63.0)	54(37.0)	50(64.9)	27(35.1)	.77667	ns
Practice safe sex						
	85(92.4)	7(7.6)	43(89.6)	5(10.4)	.57320	ns
Use seatbelts regularly						
	125(85.6)	21(14.4)	68(88.3)	9(11.7)	.57491	ns

*no significance was found at alpha = .05

Table 3

Summary of Posttest Data

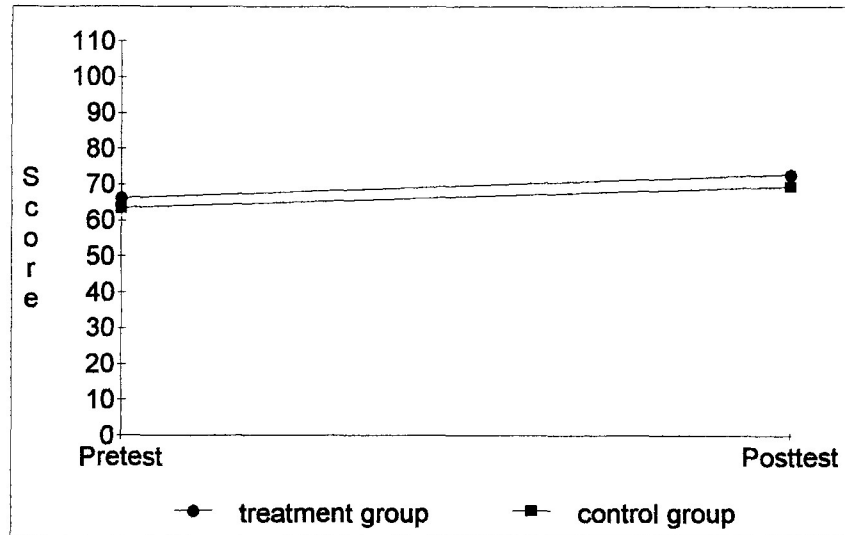
Variable	Treatment (n=132)		Control (n=80)	
	\bar{x}	S.D.	\bar{x}	S.D.
HKI	72.80	14.90	69.50	12.60
Exercise/week	2.41	1.68	2.28	1.61
Cigarettes/day	3.56	15.36	9.00	25.70
Alcohol/week (drinks)	2.74	4.53	2.35	4.14
Breakfast/week (days)	3.94	2.51	3.75	2.41
Sleep/day (hours)	7.03	1.09	7.20	1.08

Table 5

Summary of Treatment Effect on Knowledge and Behavioral Variables

Variable	Posttest Mean	n	F	p*
HKI				
Treatment	72.8033	122	1.883	ns**
Control	69.5441	68		
Exercise				
Treatment	2.4080	125	.160	ns
Control	2.2836	67		
Cigarettes/day				
Treatment	3.5635	126	.000	ns
Control	8.9710	69		
Alcohol/week (drinks)				
Treatment	2.7387	111	.013	ns
Control	2.3538	65		
Breakfast/week (days)				
Treatment	3.9365	126	.412	ns
Control	3.7536	69		
Sleep/day (hours)				
Treatment	7.0316	95	.555	ns
Control	7.2034	59		
*ANCOVA; Pretest mean was covariate				
**ns = no significant difference at alpha = .05				

Figure 1

Pretest and Posttest Means on HKI

control group ($\bar{x} = 69.5$; S.D. = 12.6) was not shown to be significantly different than the pretest mean ($\bar{x} = 63.5$; S.D. = 11.6) ($F = 2.46$; 1,174 d.f.; ns).

Research Hypothesis 2: The students participating in the personal health assessment will demonstrate an increase in healthy behaviors as compared to the students not participating in the personal assessments.

To test this hypothesis, it was necessary to utilize both analysis of covariance and chi-square as the data collected from the behavioral assessment varied from numerical responses to nominal level responses. The analysis of covariance results are summarized in Table 5 which indicates no significant differences were found at the posttest between the treatment group and the control group at $\alpha = .05$ on these variables.

The remaining behavior variables were analyzed by the statistical procedure of chi-square. The analysis was performed on the pretest data and again on the posttest data. No significant difference was found between the treatment and the control group either time. Tables 2 and 4 present the results of the pretest and posttest analyses.

Chapter 5

Conclusion

Summary of Results

The statistical methods of analysis of covariance and chi-square were used to determine if any significant knowledge and behavior difference existed between the personal health classes that attended the personal assessments and those that did not. Analysis of covariance was performed on the numerical data in which no significant differences were found between the treatment and the control groups. Chi-square analyses were performed on the nominal level data. The chi-square analyses determined no significant differences between the control group and the treatment group at the posttest, thus indicating no significant effect of treatment.

Discussion

The nation is undergoing health care reform in response to the increase of health care costs. Many changes are being implemented to combat the rise in health care expenses. Health education presents a means to control and reduce health care costs through prevention, as well as a means to increase American's quality of life.

Several areas have been targeted to carry out health education, such as primary and secondary school systems. School health education can be advantageous due to the large number of people that can be reached and the potential for positive reinforcement. For these reasons, postsecondary schools can also be an invaluable site for health promotion. By developing effective methods of health education, school programs can be a powerful instrument in reducing the nation's health care costs.

The results of this study indicated no significant differences with the implementation of personal assessments into Personal Health 100 curricula. The observed mean scores of the HKI did increase on the posttest as compared to the pretest; however, the size of increase was not shown to be different among the control and treatment groups. As a result of finding no significant differences, the research hypotheses for this study could not be supported.

The fact that the HKI scores did not increase significantly may indicate a disconnection between the Personal Health 100 classes and the student's health knowledge. Logic would follow that as students completed a personal health course, their health knowledge would increase. Yet, the results of this study suggested little health knowledge gain among the students surveyed. This evidence suggests a gap between the course material and the actual knowledge retained by the student.

Limitations

The generalizability of the results of this research is limited by the sample chosen for this study as the sample was not a true random sample. Therefore the results can only be generalized to the specific sample studied.

Another concern is that the respondents may not have been completely honest when answering the behavioral assessment. The instrument was a self-report questionnaire, and the students may have been concerned about the confidentiality of the responses as some of the items may have been considered sensitive.

Other factors influencing health behaviors were not included or controlled for in this study. Reinforcing factors contrary to the focus of this study may have had more of an influence on the students than the Personal Health 100 class or the personal assessment.

The treatment group had almost twice as many participants (n=158) as did the control group (n=80) which may also be a limiting factor.

Also noted, the mean ages for both the treatment and control groups were approximately 21 which may not be representative of a typical 100 level health class.

Other possible limitations were the duration of the study and smaller control group size. The study was conducted over the course of one semester, essentially four months, which may not have been enough time to allow for behavior change. It may also be important to note that this was the first semester incorporating the personal assessments and the effectiveness may improve in future implementations.

Conclusions

Based on the statistical analyses, no significant differences between groups were found in this study. This leads to two conclusions:

1. The addition of personal health assessments did not lead to an increase in health knowledge.
2. The addition of personal health assessments did not lead to an increase in healthy behaviors.

Implications

The nature of college settings provides a unique opportunity for health promotion and intervention. The combination of well-established student health services, availability of athletic activities, and the classroom setting provide essential elements of beneficial health education. It seems most practical to utilize the college setting as a means to further the nation's health goals. The results of this study, even though no effect was found, still holds some implications for

health education. The results suggested that more creative and innovative methods of health education are needed at the postsecondary level, specifically in the Personal Health 100 classes at Western Kentucky University, in order to increase health knowledge and healthy behaviors.

Recommendations

Based on the results of this study, the following suggestions are made for future studies:

1. Other factors influencing the student's health behaviors need to be considered in future studies.
2. The personal assessments should be better integrated into the course content with explanations of the purpose and benefits for the students.
3. Class activities allowing the students to internalize or personalize the information presented should be incorporated into the class and assessments
4. A long term study should be conducted to determine if the class and personal assessments have benefits that exist beyond the course of the semester.
5. Other measures of change should be devised and incorporated into the program to determine which educational strategies are more influential on the students.
6. Reinforcing factors or incentives should be incorporated into the curricula to help influence student's behaviors.

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Appendix A

Health Knowledge Inventory

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C.Wayne Higgins,PhD.,Thomas Nicholson,PhD.,MPH

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Department of Public Health
Western Kentucky University
Bowling Green, Kentucky 42101

THE HEALTH KNOWLEDGE INVENTORY

1. According to health professionals which of the following weight reducing techniques is the most highly recommended?
 - a. Hypnosis
 - b. Fasting and/or fad diets
 - c. Sweat belts and spot reducing techniques
 - d. Regular exercise combined with reduced caloric intake
2. The risk of heart disease is most serious for women who smoke and
 - a. Have arthritis
 - b. Are pregnant
 - c. Use oral contraceptives
 - d. Have osteoporosis
3. Hashish is a derivative of:
 - a. Mescaline
 - b. LSD
 - c. Psilocybin
 - d. Marijuana
4. All of the following statements are true about shock except:
 - a. It is easier to prevent shock than to treat it
 - b. The victim's temperature is usually high
 - c. Vomiting is common
 - d. Breathing is shallow and irregular
5. Of the following, which statement is inaccurate?
 - a. The dying patient should be separated from other patients during the final period
 - b. Terminally ill patients should be told they are dying
 - c. Most patients prefer to die at home rather than in a hospital
 - d. Doctors and nurses usually do not communicate easily with each other on issues relating to the needs of the dying patient
6. Osteoporosis is associated with a deficiency of:
 - a. Vitamin A
 - b. Calcium
 - c. Potassium
 - d. Vitamin B12
7. A positive HIV antibody test means:
 - a. The person has full blown AIDS.
 - b. The person is infected with the AIDS virus, and most certainly will develop AIDS.
 - c. The person was exposed to the virus that causes AIDS, but has developed antibodies to the virus and is immune.
 - d. The person may or may not have AIDS now, but will probably develop AIDS in the future.
8. Pushing painful thoughts or feelings from the conscious mind is indicative of:
 - a. Sublimation
 - b. Regression
 - c. Reaction formation
 - d. Repression

9. Carbon monoxide is dangerous because it:
 - a. Destroys cilia in the lung's air sacs
 - b. Impairs the red blood cells' oxygen-carrying function
 - c. Helps to create fluorocarbons in the air
 - d. Causes sterility once the accumulation reaches toxic levels
10. Immediately following a strenuous workout a person should:
 - a. Drink a large quantity of water to replace lost body fluids
 - b. Eat a hearty meal to replace needed energy
 - c. Walk or jog slowly in place
 - d. Lie down and relax
11. A heart attack is known as:
 - a. Congestive heart failure
 - b. Cardiac ischemia
 - c. Endocarditis
 - d. Myocardial infarction
12. What kind of fats produce the largest concentrations of cholesterol in the blood?
 - a. Unsaturated fats
 - b. Saturated fats
 - c. Vegetable fats
 - d. Polyunsaturated fats
13. When a person is in very good physical condition his or her heart:
 - a. Pumps faster
 - b. Produces fewer abnormal heart sounds
 - c. Pumps more slowly
 - d. Produces more arrhythmias
14. Individuals who derive sexual excitement from dressing in the clothes of the opposite sex are called:
 - a. Transvestites
 - b. Homosexuals
 - c. Transsexuals
 - d. Bisexuals
15. If you suspect internal bleeding:
 - a. Apply hot compresses to the area
 - b. Give fluids such as water
 - c. Apply cold compresses to the area
 - d. Give a depressant such as alcohol
16. In America, it is presently illegal to:
 - a. Medically prolong life against a person's will
 - b. Practice active euthanasia
 - c. Practice passive euthanasia
 - d. Write a "living will" or a "durable power of attorney" for health care
17. Rheumatic fever is best prevented by:
 - a. Periodic physical examination
 - b. Controlling high blood pressure
 - c. Prompt treatment of streptococcal infections
 - d. Eliminating foods high in cholesterol from the diet

18. Microorganisms that can harm or injure the human host in some way are called:
- a. Microbes
 - b. Pathogens
 - c. Hosts
 - d. Bacteria
19. What type of vitamin supplement does a person eating a well-balanced diet need?
- a. Only Vitamin C
 - b. A multiple vitamin tablet
 - c. A multiple vitamin tablet with iron
 - d. No supplements are needed
20. Exercises that pit one muscle, or part of the body against another or against an immovable object in a strong but motionless pressing or contracting are called:
- a. Isometric
 - b. Static
 - c. Isotonic
 - d. Ballistic
21. The type of chest pains usually felt by someone experiencing a heart attack:
- a. Pain in the left chest, centering on the nipple
 - b. Squeezing, aching, or pressing pain
 - c. Sharp or jabbing pains
 - d. Pain will increase with movement
22. Gonorrhea is harder to cure today because:
- a. There are more cases than doctors can treat
 - b. Mutant strains have developed that are resistant to penicillin
 - c. The disease has become harder to detect
 - d. The disease does not respond to conventional nutrition therapy
23. When helping someone who is suffering from depression, a friend or family member should:
- a. Call the help line immediately
 - b. Be an attentive, non judgemental listener
 - c. Try to cheer the person up
 - d. Tell the person to get hold of themselves and "pull themselves up by their bootstraps"
24. A woman who smokes during her pregnancy increases the chances that she will have a baby that:
- a. Is born addicted to nicotine
 - b. Has Down's Syndrome
 - c. Suffers neurological damage
 - d. Has low birth weight

25. Which of the following statements is not true?
- Lifestyle can have a significant effect on one's health
 - Aerobic exercises generally require a high expenditure of calories
 - A cardiac patient who exercises is less likely to have another heart attack
 - If you need recovery time after performing a strenuous activity, it's a signal that you've done too much
26. The most effective method of birth control, excluding sterilization is:
- Combination pills
 - The minipill
 - The diaphragm
 - The sponge
27. A type of cancer for which a genetic link has been identified in some cases:
- Skin
 - Bladder
 - Breast
 - Lung
28. During the flu season, health officials generally recommend flu vaccine for:
- The elderly and chronically ill
 - Young children
 - Young adults
 - The general population
29. A generic name indicates:
- The chemical content of a drug
 - The name of the individual who discovered the drug
 - The name of the company that manufactures the drug
 - The drug contains a narcotic derivative of some kind
30. Which vitamin is found in fortified milk and produced by the body in response to ultraviolet light?
- Vitamin E
 - Vitamin K
 - Vitamin C
 - Vitamin D
31. Pesticides have their greatest threat to human well-being by:
- Affecting the central nervous system
 - Increasing the population of disease carrying insects
 - Causing food producing plants to not grow as genetically designed
 - Over stimulating human growth causing organ malfunctions
32. Which of the following is a recognized method for controlling bleeding?
- Elevating the wound
 - Apply direct pressure
 - Apply pressure points
 - All of these methods

33. The most common attitude toward death in American society has been described by scholars as one of:
- a. Death denying
 - b. Death defying
 - c. Death desiring
 - d. Death accepting
34. Individuals believed to be suffering from acute alcohol intoxication:
- a. Should be forced to vomit
 - b. Should be placed in a cold shower immediately
 - c. Should be left alone to sleep
 - d. Should receive emergency medical help immediately
35. Identify the cause of more than half of all fatal residential fires.
- a. Cigarette smoking
 - b. Children playing with matches
 - c. Malfunction of electrical appliances
 - d. Cooking
36. Exercise that forces the body to increase its utilization of oxygen is:
- a. Aerobic exercise
 - b. Isometric exercise
 - c. Calisthenic exercise
 - d. Isotonic exercise
37. _____ occurs when a person's vital body signs (heartbeat, respiration) cease functioning.
- a. Clinical death
 - b. Cellular death
 - c. Brain death
 - d. Spiritual death
38. The most common and most curable of all cancer is:
- a. Colon
 - b. Breast
 - c. Skin
 - d. Lung
39. Which of the following is a weakness of a strict vegetarian diet?
- a. Too much bulk and fiber content
 - b. Tends to aggravate high blood pressure
 - c. It could lack essential amino acids
 - d. Tends to cause diarrhea
40. _____ is the capacity of a muscle to exert a force against a resistance.
- a. Strength
 - b. Flexibility
 - c. Endurance
 - d. Coordination
41. Which of the following statements is true?
- a. Most old people are basically alike
 - b. Most old people live at or below the poverty level
 - c. Most old people will be a victim of crime
 - d. Most old people retain their interest in sex
42. Which of the following is not a biological factor in depression?
- a. Low blood sugar
 - b. Elevated cholesterol level
 - c. Nutritional deficiency
 - d. Imbalance in the brain levels of certain neurotransmitters

43. Analgesic drugs are used to:
- a. Reduce pain
 - b. Reduce swelling
 - c. Reduce fever
 - d. Reduce nausea and vomiting
44. A lack of dietary or supplemental iron will cause:
- a. Anemia
 - b. Diabetes Mellitus
 - c. Hypoglycemia
 - d. Herpes Type I
45. LSD, mescaline, and psilocybin are classified as:
- a. Opiates
 - b. Depressants
 - c. Stimulants
 - d. Hallucinogens
46. The most prevalent form of rape in the United States is:
- a. Date rape
 - b. Child molestation
 - c. Marital rape
 - d. Rape of a person from a different race or ethnic group
47. _____ is a diagnostic test for breast cancer.
- a. Pap smear
 - b. Arteriogram
 - c. Mammogram
 - d. Electromyogram
48. Of the following, which is not a characteristic of bulimia?
- a. A conscious, relentless attempt to diet
 - b. Primarily affects adolescent females
 - c. Consequences may include inflammation and bleeding of the esophagus and loss of dental enamel
 - d. Eating binges followed by induced vomiting
49. The major threat to the quality of the United States water supply is:
- a. Agricultural chemicals
 - b. Organisms that cause cholera and thyroid fever
 - c. Industrial chemicals
 - d. Garbage disposal
50. Exercising the body at levels greater than to which it is accustomed is referred to as:
- a. Overload
 - b. Cardiorespiratory endurance
 - c. Training effect
 - d. Principle of reversibility
51. Breast and testicular self-exams should be done:
- a. Monthly
 - b. Every 3 months
 - c. Twice a year
 - d. Once a year
52. Although only one area of the body may be injured, the body as a whole may react by depressing vital processes. This condition is:
- a. Shock
 - b. Anoxia
 - c. Asphyxia
 - d. Vital depression

53. Which of the following statements about Alzheimer's disease is inaccurate?
- a. Alzheimer's is an organic brain syndrome that primarily affects the elderly
 - b. Alzheimer's is incurable
 - c. Alzheimer's is primarily caused by atherosclerosis
 - d. Most Alzheimer's patients are cared for at home rather than being institutionalized
54. The primary psychoactive ingredient in marijuana is:
- a. Peyote
 - b. THC
 - c. DMT
 - d. Methedrine
55. Fertilization usually occurs in the:
- a. Fallopian tubes
 - b. Vagina
 - c. Ovaries
 - d. Uterus
56. The primary role of the Food and Drug Administration (FDA) is to:
- a. Protect the public from quackery
 - b. Enhance buyer awareness
 - c. Regulate the effectiveness, safety and labeling of drugs
 - d. Develop and enforce uniform safety standards
57. Angel dust is a slang name for:
- a. Mescaline
 - b. Cocaine
 - c. Opium
 - d. PCP
58. If a child has swallowed a bottle of medicine, who should be called?
- a. Toxic Substance Clinic
 - b. American Red Cross
 - c. Poison Control Center
 - d. A pharmacy
59. Which of the following statements about the effectiveness of aerobic exercises is true?
- a. Aerobic exercises should be done daily for 1 to 2 hours per session
 - b. Aerobic exercises should be done 3-4 times weekly for approximately 20-30 minutes per session
 - c. Aerobic exercises should be done once per week for 30-45 minutes per session
 - d. Aerobic exercises should be done once per month for 1 hour per session
60. Antibiotics are effective in treating diseases caused by which of the following category of organisms?
- a. Viruses
 - b. Animals
 - c. Bacteria and fungi
 - d. Parasitic worms

61. The major danger associated with quack treatments is:
- They tend to create false hopes of cure
 - They may have a placebo effect
 - Effective treatment may be delayed
 - Money is needlessly wasted
62. Foods served at fast food restaurants typically tend to be:
- High in calories, fat, and salt content
 - High in calories, low in protein and salt
 - Low in calcium and fats, high in sugar
 - Low in protein, sugar, and salt
63. Menopausal symptoms are primarily attributable to:
- The "empty nest" syndrome
 - Estrogen deficiency
 - Cultural expectations
 - Environmental influences
64. Which of the following procedures should be used as a last resort to stop severe bleeding?
- Apply a tourniquet
 - Elevate the injured part
 - Apply direct pressure to the wound
 - Apply pressure to the supplying artery
65. A negative HIV antibody test means:
- The person almost certainly will get AIDS.
 - The person is a carrier of the AIDS virus.
 - The person has been infected with the AIDS virus, has developed antibody, and is immune.
 - The person has almost certainly not been infected with the AIDS virus.
66. A health care provider who believes that all diseases are related to spinal dislocations is called:
- An Osteopath
 - An Orthopedist
 - An Internist
 - A Chiropractor
67. Ascribing an undesirable thought or action of one's own to another person is called:
- Displacement
 - Reaction formation
 - Projection
 - Compensation
68. Side effects commonly associated with alcohol do not include:
- Irritates the gastrointestinal tract
 - Enhances the effects of other depressant drugs
 - Enhances sexual performance
 - Acts as a diuretic

69. The source of water pollution most likely to be contaminated with disease organisms is:
- Synthetic organic chemicals
 - Inorganic chemicals and minerals
 - Radioactive substances
 - Human sewage
70. A rule to prevent infection is to never touch a wound with any thing that is not sterile, the most important exception to this is:
- If there is severe bleeding
 - If the wound is a burn
 - If there is clothing sticking to the wound
 - If the wound is a puncture and not bleeding
71. A document that indicates the signer's preferences for medical treatment in the event a person is diagnosed terminally ill and is unable to express his/her choice or wishes regarding their medical treatment.
- Last will and Testament
 - Durable Power of Attorney for Health Care
 - Living Will
 - Informed consent form
72. A biopsy is:
- A radioactive substance which tends to destroy a cancerous tumor
 - Removal of tissue for examination
 - Sputum sample examined for cancerous cells
 - A scanning procedure to check for cancer
73. A sexually transmitted disease that can also be picked up from towels or toilet seats is:
- Syphilis
 - Genital Herpes
 - Pubic lice
 - Gonorrhea
74. Two diseases that quacks frequently claim to be able to cure are:
- Arthritis and cancer
 - Diabetes and baldness
 - Heart disease and asthma
 - Obesity and epilepsy
75. Disorders which originate in the mind and manifest themselves in bodily symptoms are known as:
- Panic attacks
 - Psychosomatic complaints
 - Affective disorders
 - Neurotic reactions
76. Air pollutants which affect the respiratory system cause:
- The cilia to slow down - thereby allowing a greater absorption of the pollutant into the body
 - The cilia to speed up thus becoming more effective
 - More cilia to be generated so as to increase cleansing efficiency
 - Cilia to grow longer - thereby increasing their resistance

77. Teenage mothers are more likely to have all the following with the exception of:
- Premature babies
 - Stillbirths
 - Shorter labor
 - Higher maternal mortality
78. When treating a suspected fracture you should:
- Move the victim to a more convenient location
 - Treat for shock; and immobilize the injured area
 - Set or reduce the fracture
 - Strengthen a joint that is out of alignment
79. When dealing with bereaved children it is advisable to do all the following except:
- Allow the child to attend the funeral or memorial service if he/she wants to
 - Grieve openly in the presence of the child
 - Tell the child the truth about how, when, where a significant other died
 - Tell the child that death is like "going to sleep", "going on a trip," etc.
80. Which of the following has been associated with cancer?
- Chemicals presently used in food for coloring
 - Diets low in vitamins
 - Diets low in fats and high in sugar
 - Diets high in fats and low in fiber
81. Preparations of weakened or killed pathogens that stimulate antibody formation without causing observable signs and symptoms of the disease are called:
- Vaccines
 - Antibiotics
 - Toxoids
 - Pheromones
82. Acetaminophen is of no value in the treatment of:
- Fever
 - Pain
 - Inflammation
 - Headaches
83. The best way to get the different nutrients we need is to:
- Eat a wide variety of foods
 - Take a vitamin and mineral supplement daily
 - Eat only "organically" grown foods
 - Eat a good breakfast daily
84. The term "dementia" means:
- To be deprived of the mind
 - To be dying
 - To be psychotic
 - To be elderly
85. The term "freebasing" is associated with:
- PCP
 - Cocaine
 - Heroin
 - LSD

95. Which drug is the most potentially lethal when combined with alcohol?
- a. Barbituates
 - b. Marijuana
 - c. Cocaine
 - d. Decongestants
96. Which of the following is most likely to lead to hearing loss?
- a. Loud music during a party
 - b. Illness and ear disease from drinking too much liquor
 - c. Continually listening to loud music through headphones
 - d. Soundwaves emitted from the TV
97. Individuals who manifest both masculine and feminine psychological traits are termed:
- a. Transsexuals
 - b. Gender confused
 - c. Bisexuals
 - d. Androgynous
98. Diabetes mellitus involves a malfunctioning of which gland?
- a. Adrenal
 - b. Pancreas
 - c. Thyroid
 - d. Pituitary
99. Which of the following is a well-balanced dietary program?
- a. Atkins diet
 - b. Stillman diet
 - c. Weight Watchers
 - d. Liquid protein diet
100. In which of the following stages of bodily reaction to stress is psychosomatic illness most likely to occur?
- a. Alarm stage
 - b. Resistance stage
 - c. Exhaustion stage
 - d. Holistic stage
101. The condition known as "runners' high" has been associated with the release of brain chemicals known as:
- a. Endorphins
 - b. Prostaglandins
 - c. Steroids
 - d. Platelets
102. Research on the incidence of child molestation indicates that most child molesting is done by individuals who are _____ in their sexual orientation.
- a. Bisexual
 - b. Homosexual
 - c. Heterosexual
 - d. Asexual
103. Physical exercise is beneficial to the elderly because it provides all the following results except:
- a. Lowers cholesterol levels
 - b. Prevents the loss of brain cells
 - c. Increases respiratory efficiency
 - d. Reduces mental anxiety and tension

104. Which group is at the greatest risk of developing diabetes mellitus?
- a. Adult males
 - b. People under 20
 - c. The obese
 - d. People whose diet is high in simple carbohydrates
105. Which of the following diseases may deform a fetus if an expectant mother contracts it during the first 3 months of pregnancy?
- a. Smallpox
 - b. Measles
 - c. Rubella (German measles)
 - d. Varicella (Chicken pox)
106. _____ insurance provides for loss of income for work absences resulting from illness or injury.
- a. Comprehensive
 - b. Catastrophic
 - c. Major medical
 - d. Disability
107. Understanding another's emotional thoughts and feelings is called:
- a. Compassion
 - b. Empathy
 - c. Tolerance
 - d. Sympathy
108. Sunlight causes changes in natural air components and pollutants, thus producing additional pollutants. This explains:
- a. High hepatitis incidence
 - b. Thermal inversion
 - c. Photochemical smog
 - d. Ionizing radiation
109. Contemporary research indicates that the primary cause of homosexuality is:
- a. A hormonal dysfunction
 - b. Heredity
 - c. Poor relationship with parents
 - d. Cause has not been identified
110. If you burn yourself on the hand with a hot iron, you should:
- a. Cover the wound with butter or other grease
 - b. Cover the wound with a cotton ball dipped in oil
 - c. Cover the wound with sterile gauze that has been dipped in warm water
 - d. Immerse the wound in cold water

Appendix B

BEHAVIORAL ASSESSMENT

1. How many days a week, on average, do you exercise vigorously for at least 20 consecutive minutes?
0 1 2 3 4 5 6 7
2. Do you use tobacco cigarettes? No Yes
If yes, on average, how many times a day? _____
3. Do you drink alcohol? No Yes
If yes, on average, how many drinks do you consume in a week?

Have you had five or more drinks in the past two weeks? No Yes
4. How many days a week do you eat breakfast?
0 1 2 3 4 5 6 7
5. Do you generally snack between meals? No Yes
6. How much do you sleep during an average 24-hour period? _____ (number of hours)
7. Are you sexually active? No Yes
8. Do you regularly practice safe sex? No Yes
9. Do you regularly use seatbelts? No Yes